

Memorandum

To: Richard French
 From: Keith Redford
 Date: November, 2008
 Subject: **MSF Partners** (Hangar Floor Problem), McKinney, Texas

Background

In August 2008, **MSF Partners** completed twenty-four (24) hangars at the McKinney airport (presold as “condominium” hangars), all completed with epoxy/urethane floors installed. The flooring applicator was **Chemical Coatings, LLC** and the products used were from **Garland Floor Coatings**. The floors are **exceptional**, both from an **application and product** standard. Again, both the **application and products** were well **above industry standards**.

Unfortunately, the highly cross-linked urethane topcoat (and **because of the good topcoat properties**, i.e., good color development, long-term gloss, abrasion resistance, chemical resistance, etc.) bubbled (because the urethane topcoat cannot breathe). This bubbling occurred



FIGURE 1: Photographs showing bubbles



FIGURE 2-4: Diamond grinding / removing bubbles to bare concrete

because of osmosis of trapped water (exaggerated by the proximity of a one (1”) inch cold joint). Again, the osmosis (passage of water) through the semi-permeable pores of the concrete is “bubbling” the front of the hangars, but limited to approximately twelve (12”) inches (see Figure 1) inside the hangar floor from the apron.

Repair Methodology

In October 2008, **MSF Partners** asked us to help solve the problem [(pronounced, but limited to seven (7) hangars of twenty-four (24)]. We started by diamond grinding the bubbled areas to bare concrete (see Figure 2-4) followed by burning the removed areas (see Figure 5). Then, following the suggestions of many, **MSF Partners** removed three (3) of the front hangar cold joints (filled with a bituminous tar-like mixture of hydrocarbons derived from petroleum (see Figure 6). This was removed to eliminate standing/trapped



FIGURE 5: Flame treating surface removing moisture

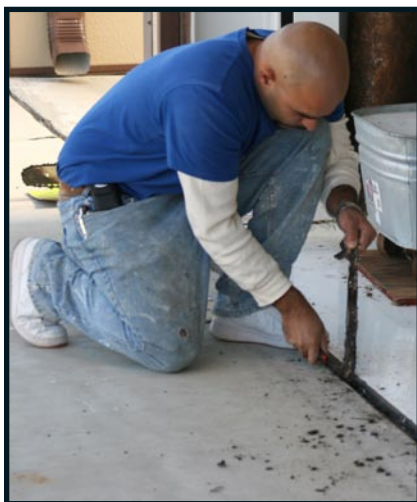


FIGURE 6: Removing bituminous tar-like caulk



FIGURE 8-13: Hangar "lip" repaired/test areas installed.

water. This was followed by caulking with **E31-1205** after surface preparation and placing of backer rod. We then "re-prepared" the removed surface and primed with **E31-1202**; then top-coated with **U31-1201** (see Figure 8-13) high performance urethane.

Summary

We cannot guarantee complete success, and only time will tell, but we have **sound reasons to expect success over the hydrodynamic's problem at MSF Partners McKinney Texas hangars.** Even with the "bubbling problem," the **MSF Partner's** hangars are exceptional and anyone would be proud to own one!

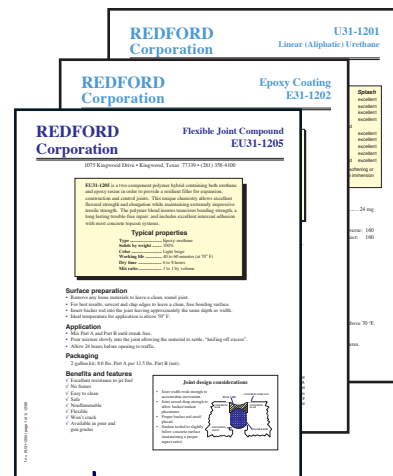


FIGURE 7: Caulking with E31-1205

General photographs of the beautiful hangars and aircraft occupying those hangars



Postscript 11/08

While making these **repairs/installing test/demonstration areas**, we met with the owner for #4 (at **MSF Partner's** request). Though we told him it was impossible to answer, he asked “where did the loss of adhesion from the front lip/apron stop?” We told him, and we believe it to be factual, “that his floor has adequate long term adhesion 2-3 feet inside the lip/apron – that he probably will never have further problems beyond 2-3 feet inside the lip/apron (if nothing else, because of the thickness/tensile strength of the existing coating).” We explained “that could be guaranteed if he were to climatize the hangar and keep it a constant temperature.”

Summary: We reiterated that #4 is installed above industry standards, that except for the front lip; the floor has **good and adequate long term adhesion.**